



photo by Henry de Cuyper Cadmus

Principal David Johnston's installation Friday was a ceremonious and traditional affair. Costs for the event are currently unknown. According to Sheila Sheldon, associate secretary of Senate, no budget was drawn up and only the arrival of the bills will tell the true price.

North American debaters enjoy a querulous weekend

by Heather Tisdale

Eighty-six teams of debaters descended on McGill this weekend for the 31st Annual International Winter Carnival Debating Tournament.

The debaters came from across Canada and the United States and from as far away as Scotland.

The ultimate victory went to the Concordia team of Alan Patrick and Bonnie Honig who defeated the team from University of Western Ontario in the final round of the tournament Saturday.

Charles Kennedy of the University of Glasgow took top honour as best speaker in the tournament debating and Jeff Berger from the University of Toronto won as best speaker in prepared public speaking.

The topic of the final debate was "Wit is Cultured Insolence," and the Concordia team used the resolution as an opportunity to poke fun at debaters and the debating circuit.

"Debaters rebel against society by debating, rather than turning to murder, looting and rape," said Alan Patrick.

Western's Michael Dubroy skirted the issue and said: "My debating partner is going to demonstrate 23 points of wit and every one of them will be in the form of a rhyming couplet."

Bonnie Honig contended that "humour is the amniotic fluid of debate."

The Concordia team argued that debating was an activity for sophisticates, but Western's Ian Gemmel said: "We sit up all night playing cards and drinking ourselves into stupors. This is the enjoyable part of debating and it's not sophisticated."

Another speaker praised the organizers of the tournament

for doing an "incredible job. They've fed us, gotten us drunk and killed our brain cells."

At a banquet held at the Four Seasons Hotel before the final round, debaters expressed satisfaction with the tournament and its accompanying festivities.

"The most amazing thing is every event ran on time," said one organizer.

Bishop's and Champlain students pay a visit to the Soviet embassy

by Kimberley Stephenson

Forty students from Bishop's University and Champlain College were in Montreal Friday to protest the recent Soviet invasion of Afghanistan.

Although the organizers from Bishop's made calls to both McGill and Concordia, there were no students from either university present.

Co-organizers Bill French and Libby Gunn described the protest in front of the Soviet embassy as having a three-fold purpose.

"Firstly, we want to protest the Soviet invasion of Afghanistan, the rape of the country for Soviet purposes, and in-

crease Soviet awareness of the danger of the issue. Secondly, we want to increase student awareness. Students are not generally prone to demonstrating, especially students from Bishop's," said French.

The third purpose, according to Gunn, was to make the Canadian government aware of how students and others feel about the issue.

"We want the Canadian government to take a harder line, and hopefully raise Canadian awareness of what the Soviets are doing," said Gunn.

"I just wanted to show that we're against expansion," said Bishop's student Peter

New principal installed in pomp and glory

by Rick Boychuk

In a ceremony filled with the pomp and circumstance of another age, David Johnston was installed as McGill's 14th principal Friday.

The installation, held in Theatre Maisonneuve at Place des Arts, was attended by more than 1,300 invited guests, among whom were representatives of 50 North American universities.

University spokespersons said it was the largest and most ostentatious installation ceremony held at McGill in more than 40 years.

"Tradition is coming out of the woodwork," said McGill public relations officer Betsy Hirst.

"Public confidence in the university is beginning to erode. This is sort of a big, loud gesture for McGill."

The installation included lunch for 350 at the Four Seasons hotel, an hour-long ceremony at Place des Arts and a "vin d'honneur" in the lobby afterward.

Johnston was joined on the stage by McGill's Board of Governors, the Senate, representatives of other universities, Governor-General Ed Schreyer and Mayor Jean Drapeau. All wore academic gowns, many of them rented by the university for the occasion.

The university had programs

printed on egg shell colored rag edged vellum for visitors to follow the proceedings.

McGill officials said they did not know how much the installation cost, and would not know until all the bills had been received. A budget was not drawn up, said associate secretary of Senate Sheila Sheldon.

"We tried to do it as cheaply as possible," she said.

In his acceptance speech Johnston stressed the continuing need for a "collegial system of government and collegial goals" at McGill.

"I believe collegiality and quality will be closely interlinked in this decade, that we shall succeed in both or succeed in neither," he said.

McGill Daily asks for autonomy and incorporation

by Harold Koblin

Students' Council voted last Wednesday to strike a committee to investigate the relationship between the Students' Society and the Daily.

The committee, mandated to report at the next Council meeting, will be composed of two Council members and two Daily staffers.

It was formed in response to a brief submitted by the Daily that called for the paper to become an autonomous corporation funded by a separate student levy.

Brian Topp, the Daily's business manager, was present to explain the Daily's request. He said the autonomy drive began after the Daily completed an examination of council-student newspaper relationships at camp across the country.

"We saw the autonomy drive began after the Daily com-

"We saw in the other universities newspapers and student councils who were constantly wasting time and energy by fighting with each other.

"On many a campus the way the problem got solved was

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Classified

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LOST: a gold loop earring. Great sentimental value. If found please contact N. Stubina at 382-2515.

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P. G. S. S. Council Meeting

Monday, February 11
8:30 P.M., at Thomson House
3650 McTavish

Minutes of last council meeting available at Thomson House from 4:00 P.M. Monday afternoon.

FREE FILM SHOWING

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12:30 pm - Lunch-time Lecture Series. Topic: "Boat People - 1939 & 1979." Alazar Eliachiv, author and professor of Jewish Studies compares the Jewish experience of Holocaust to the predicament of the Boat People.	Israeli Folkdancing - Union Ballroom, 3480 McTavish. Beginners: 7:00 pm; Advanced: 8:30 pm. Students: \$1.25. Coffee & sandwiches served at Golem 4:30 to 6:30 pm.	8:00 pm - Frank Dawson Auditorium. Cults: The Search for a New Way? Topic: "Kidnapping or Rescue?... The Legal Aspects of Leaving a Cult" with Galen Kelly, private investigator & James Leavy, Montreal attorney.	7:30 pm - Intermarriage Series - "Mixed Marriage, Intermarriage and Conversion: Jewish concerns & modern needs" with Rabbi H. Joseph. Call today for more info regarding the series.	8:00 pm - Leacock Bldg., rm. L-26 Road to Peace in the Middle East with Matti Peled, retired General of the Israeli army & professor of Arabic Studies and Michael Har-Segor, professor of early modern European History: both of Tel-Aviv University.	5:30 - Golem. Come & join us for Oneg Shabbat. Notify us by Thurs. if you plan to come. \$3.00 for a hot meal & fine evening in a warm place.
					8:00 pm - Union Bldg., 3480 McTavish. BURN OUT! Disco dancing with Rock & Roll hour will provide a great evening. Come & dance to music presented by DJ - Stardust. \$2.00.

Regulating Scientific Research

Test-tube Babies:

Scientists Have Labor Pains

by Marc Tessier-Lavigne and Julian Betts

On July 25, 1978, Louise Brown was born at the Oldham General Hospital, in Bristol, England. She was the first human being to be conceived by the fertilization in laboratory ("in vitro") of her mother's surgically removed egg with her father's sperm, before being replaced in her mother's womb. To date, three babies are thought to have been born by this method, the other two in India and Scotland.

With these births, the debate on the medical, social, legal and moral problems of in vitro fertilization took on a new dimension. This eventually led the Ethics Advisory Board to the American Department of Health, Education and Welfare (HEW) to reconsider, and finally abrogate in March '79 its four-year-old moratorium on all human research involving in vitro fertilization in the USA.

Their decision to recognize "research involving human in vitro fertilization" as "acceptable from an ethical standpoint," set the stage for an approval, last month, by the Virginia Health Authorities, of the opening of the first birth clinic for the conception of human embryos outside the mother's body. Although the clinic, which will open next month at the Eastern Virginia Medical School, plans to treat no more than 50 women in its first year, opponents from the Virginia Society for Human Life have vowed to prevent the opening.

Proponents of "in vitro" fertilization point to the potential benefits for infertile women who cannot normally conceive because of blocked fallopian tubes, and they see in it a powerful tool for the investigation of the process of conception. Critics fall mainly into two categories: those who believe the widespread use of the technique premature, because, to them, the dangers for the fetus and the mother have not yet been fully assessed, and those who oppose the manipulation of embryos as unethical and who fear that the technique will lead to selective human breeding, or in the words of HEW minister Joseph Califano, "attempts to control the genetic make-up of the offspring."

The procedure was developed mainly through the work of two English physicians, R.G. Edwards and P.C. Steptoe. The participating woman is stimulated with hormones to produce several ova (eggs) in a menstrual cycle (only one ovum is produced naturally). The ova are recovered by means of a minor operation called laparoscopy under general anaesthesia, during which they are removed through an incision near the navel. They are then fertilized in a laboratory dish with the father's sperm. In the natural process, the mature ovum enters a Fallopian tube, and after fertilization, travels down to the uterus where it continues to divide until it reaches the 64-cell ("blastocyst") stage, and attaches to the uterus. In the laboratory procedure, the fertilized egg is permitted to reach the blastocyst stage, and is then implanted in the mother's uterus where it grows to term. In this way, it is possible to

bypass the mother's diseased Fallopian tubes.

As early as 1968, Edwards was discussing the development of the technique. The primary incentive for the work, he claimed, stemmed "from a fundamentally humanitarian view," in an attempt to "regulate fertility," and "make it possible for some infertile parents to have their own children."

Although it is possible in many cases to surgically reconstruct the fallopian tubes, John Biggers estimates that, in the US, of the 560,000 women with tubal obstruction, at least half of them "are not likely to achieve pregnancy by surgical means alone." For such a mother who wants to bear her child, and for those deterred by the length and costs of adoption procedures, in vitro fertilization is seen as the only solution. Some critics see the threat of world overpopulation as sufficient cause to not increase the fertility pool; however, most agree

with Edwards that "the infertile should not be penalized for the sake of the overfertilized."

The case for the infertile is generally accepted, but Edwards and Steptoe's clinical procedure has come under fire. Although they publicized their work during the early '70s, the birth of Louise Brown took the scientific community by surprise. To date, their only scientific report on the birth procedure was the oral presentation given to the English Royal College of Obstetrics and Gynecology in January '79, and no report on the Indian baby has yet been received. Clifford Grobstein, in the June '79 issue of *Scientific American*, chastises the two doctors for not communicating essential data on hormonal problems, and on the procedure for matching the state of the fertilized egg with that of the uterine wall.

More fundamental criticism is levelled against the risks for the mother and the fetus, and there is much disagreement

among scientists as to the extent of our knowledge of these risks.

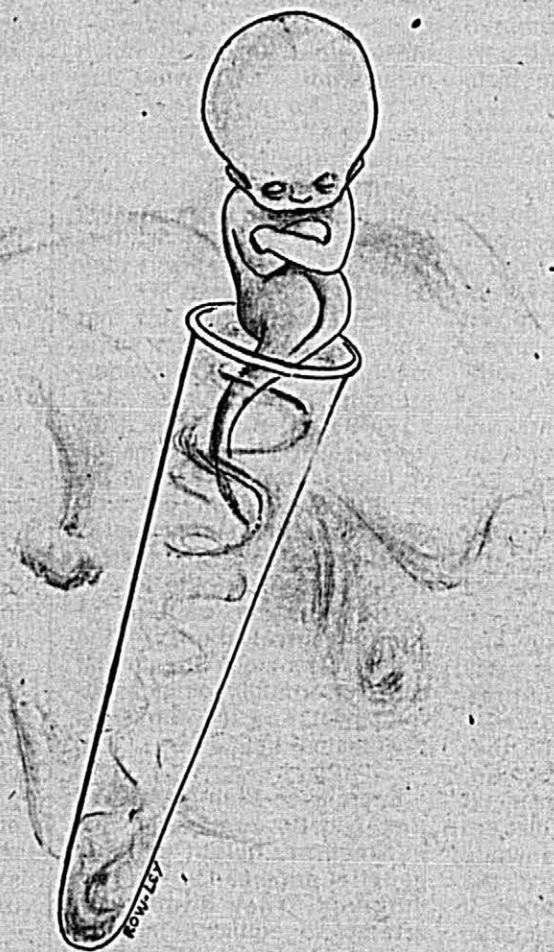
The potential offspring faces the greatest risks. It is feared that the embryo will be damaged mechanically or genetically during the procedure. Tests on rabbits show that the administration of hormones to produce many ova (superovulation) may result in a higher incidence of chromosomal abnormality of the egg. To avoid this problem, Steptoe has proposed to not use hormones, and to remove one egg per cycle. Other problems are the result of the nature and quantity of the sperm to which the egg is exposed. In natural fertilization, abnormal sperm is screened in part by the female reproductive tract. Moreover, the quantity of sperm arriving to the egg is regulated, because it must travel a certain distance.

There is, therefore, the risk that a higher incidence of fertilization either by abnormal sperm or by more than one sperm would occur in vitro. The laboratory procedure tries to simulate the screening process by "preparing" the sperm, a procedure known as "capacitation."

Most proponents of the method simply discard the above risks as irrelevant. They believe a damaged embryo would not develop. James Schlesselman reports that 99.3 per cent of chromosomally abnormal fetuses are eliminated in vivo through spontaneous abortion or fetal death.

There is no guarantee, however, that more subtle damage of the embryo will not occur. Whether they will, and whether it will be possible to correlate abnormal features of the offspring to the laboratory procedure is a matter of much controversy. Some, such as Edwards, believe that evidence from animal experiments to date is sufficient, and have forged ahead. Others claim that such studies will never produce conclusive evidence, because there are too many possible origins for damages. Most scientists agree, however, that systematic risk assessment studies should be made on animals, in particular non-human primates, and HEW has taken

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graphic by Margot Rowley

...Test-tube Babies

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upon itself to "support more animal research."

The child could also be adversely affected in social and psychological ways, by being the subject of constant medical surveillance and public interest.

In this respect, the fact that the London Daily Mail bought the exclusive rights to details of the birth and interviews with the parents of Louise Brown has spawned bad feelings in all parties.

If the risks to the fetus are ill-defined and unknown, those to the mother have been carefully assessed. The actual clinical operation is minimally invasive, and the risks involved in the subsequent pregnancy are the same as those in natural fertilization.

The greatest problem is the low success rate of the operation. In natural fertilization, of 100 eggs exposed to sperm, only 31 are fertilized and reach birth. Edwards and Steptoe tested 79 women; 68 were operated on, 44 produced eggs at the correct stage of maturity, 32 saw their eggs fertilized and cleave normally, 4 became pregnant. The final outcome was two births and two miscarriages. Those who did not give birth the first time will have to undergo the same series of operations again.

Harvard biologist and feminist Ruth Hubbard has charged that in order to gather patients Edwards and Steptoe exploited infertile women's strong desire to bear children. Those who helped develop the procedure will not benefit from it, she says, indeed, "women and their test-tube babies are the guinea-pigs of research."

Other critics believe that funds allocated to in vitro fertilization, with its low success rate, would be better directed towards improving surgical methods for repairing diseased oviducts, or to develop preventative measures against the diseases that generate infertility.

Finally, some reject the whole concept, both because its cost (presently \$4000) would confine it to the financial elite, and because, in the words of Ruth Hubbard, it reinforces "the all-too pervasive view in our society that women's lives are unfulfilled, or indeed worthless unless they bear children."

Proponents of the procedure argue in response that its success rate will increase as the technique improves. They argue further that there is no real exploitation as many women would be willing to take any risk and undergo any to be able to conceive. Finally, they refuse financial arguments which, they believe, should be directed towards the medical establishment as a whole, and not against this

technique in particular.

There is fear that this 'desire to conceive' could lead to new developments, such as egg donation to women who do not produce eggs, embryo donation, or even 'foster pregnancy.' In this scheme, a woman who, for medical reasons, could not, or who would not want to carry her child, would make use of a third party (a sister, relative, or perhaps a woman hired for the occasion) to bear a child conceived with her egg. To avoid this, HEW has stipulated in its guidelines that "embryo transfer will be attempted only with gametes obtained from lawfully married couples," and that the embryo would be "transferred back to the wife whose ova were used for fertilization." However, guidelines do not constitute legislation, and they apply only to research done with HEW subsidies. Many fear that, given the technique and the market, the advent of surrogate motherhood is at hand.

Another subject of concern is the manipulation of embryos to be implanted. Edwards hopes to "improve the quality of human life" by "identifying and averting the causes of certain forms of anomalous development." He proposes the screening and eugenic selection of the eggs. For instance, in families where the mother carries hemophilia — a genetic disease transmitted by women, but only affecting men, it would be possible to discard all male embryos. This would involve taking a cell from the early embryo and putting it into culture, while the embryo is frozen, a procedure which is technically feasible today. The cultured cells could then be examined for the determination of sex or genetic defects. The embryo would then either be thawed and implanted, or disposed of. According to Dr. David Roy, there are suspicions that this was actually performed on the Indian baby — though no scientific reports have been made.

This selection raises the same issues as those associated with selective abortion (which is legal) and other eugenic procedures. However, it is feared that the ease with which the embryo could be disposed of (compared with abortion procedures) might lead to abuse, and a real "search for the perfect baby," with specific features, such as the colour of eyes... The possibility is still remote, as the number of traits that can be read from a person's genes is limited. It has also been conjectured that the freezing process might lead to mutations in the egg. The cultured cells would then not be

representative of the egg, and the procedure would be useless.

A major source of controversy is the fate of embryos which are not implanted. The debate surrounding the right to manipulate embryos and cultivate them for the sole purpose of manipulation centers around the status of the early embryo, the question of its rights, and when it acquires the status of human being. Most people agree that manipulation should not occur once it has attained this status, but there is much disagreement as to when this occurs. Some believe this occurs at conception, and hence reject any form of manipulation. Others see the limit at a future date, ranging from a few days to months, depending on the criteria they use to define 'human life.'

The scientific benefits that would be derived from these manipulations lie in our understanding of reproductive biology. Scientists argue that they would give us information on the dangers inherent in the in vitro fertilization process. Other benefits usually quoted are the developing and testing of contraceptives, the investigation of the causes of infertility, evaluations of the effects of noxious agents and radiation on embryological development and the formation of abnormalities.

Fears have been expressed that genetic engineering experimenters might attempt genetic engineering on the embryos. They might also attempt to cultivate the embryo to term in an artificial uterus, or they might attempt to clone a human being. Cloning consists in the removal of the egg's nucleus and its replacement by the 46-chromosome nucleus of a "donor" (this is renucleation). This cell undergoes division and grows into a perfect replica of the donor because it has the donor's genetic information. To date, cloning has succeeded with frogs, producing perfect replicas of the donor-parent. Cloning of human beings was often thought a remote possibility. However, Clifford Grobstein in his Scientific American article states that "there have been recent reports on the renucleation of a human ovum with a 46-chromosome nucleus of a sperm-cell precursor." If this is the case, the cloning of human beings may not be as remote a possibility as was thought.

The Ethics Advisory Board to HEW has set up specific guidelines for research involving human in vitro fertilization without embryo transfer: This

Comment

The pace of scientific discovery and technological innovation is such today that it is impossible to ignore the impact they have on society. DNA research, contraception, in vitro fertilization and nuclear energy are a few of the recent developments that are radically altering our lives. Yet society lacks at present both ready-made attitudes and institutional means to respond and adapt to the changes afforded by scientific advance, and the hazards it carries.

No longer can we accept an anarchistic application of new technologies with the hope that "people will eventually adapt." Nor can we, given the extent of the potential dangers, accept the traditional scheme by which scientific and technological applications have been regulated in the past — scandal or disaster, public outrage and then legislation. Examples of this scenario have occurred in many fields, from thalidomide drugs to nuclear energy.

As in the past, we must fear that the social significance of future advances will be overlooked by their instigators and misunderstood by those outside the field. The monitoring of science along with public assessment of technological advance must become integral parts of scientific endeavor.

In this science issue, we look at the problems of regulation of science in two cases — recombinant DNA research and in vitro fertilization. It is not possible to give a complete recipe for regulation; however, we have tried to spell out the problems. In a forthcoming article, Dr. David Roy will give an indication of what can be done, and where we should start.

The regulation of scientific investigation is not a popular concept, because the framework in which western science has grown is that of freedom of investigation and expression. Most scientists, recalling 16th century confrontations with the church or Lysenko's stifling of Soviet biology and agriculture, would not welcome societal inspection of their work. Scientists should not see regulation as restriction; they should realize that their endeavours are no longer subject to a moral code where the scientist's right to investigate is seen as the fundamental principle. Because of the potential effects of their discoveries, scientists should be subject to a moral code somewhat akin to that of medical ethics. In the words of R.G. Edwards, the father of in vitro fertilization: "The pursuit of knowledge for its own sake is not sufficient reason for inquiry, unless tempered by clinical responsibility." Scientific freedom is the recognition of responsibility.

Current regulation of research occurs indirectly through funding, and public assessment would bring this disturbing fact to light. If the right to investigate requires the right to receive funds, then many disciplines do not enjoy scientific freedom. Great scientific advances are witnessed mainly in disciplines with potential military or industrial applications.

The problem is not of course to decide which approach is to be promoted, to the detriment of all others, but rather that of harmonizing and integrating various approaches. Public monitoring of science offers the possibility of ensuring a continued existence to disciplines which do not interest industry or the military. This is a unique opportunity both to enrich scientific investigation, and to reflect on the course we wish society to take.

Marc Tessler-Lavigne

research must comply "with all appropriate provisions of the regulations governing research with human subjects"; it must be "designed primarily: (A) To establish the safety and efficacy of embryo transfer, and (B) to obtain important scientific information toward that end not reasonably attainable by other means." In addition, no embryos can be sustained in vitro "beyond the stage normally associated with the completion of implantation (14 days after fertilization)." These guidelines affect research sponsored by HEW,

and do not regulate research in general.

To many these guidelines are insufficient. HEW does not consider the debate closed, however, and hopes to contain some of the feared practices mentioned above "by regulation or legislation." In the mean time, it interprets its statement that "research involving human in vitro fertilization is acceptable from an ethical standpoint" to mean that such research is "ethically defensible, but still legitimately controverted."

The debate has just begun.

Recombinant DNA

Genetics for Corporate Profit

by Michel Sheppard

The categories of patentable inventions provided for in the U.S. Patent Act of 1793 comprise "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof."

It probably never occurred to those who devised the legal statutes defining the criteria for patentability that life itself would one day be considered suitable to be patented as a marketable commodity.

But that is exactly what is happening lately. With the rapid advances in biological research a coalition of scientists, lawyers and corporate managers has emerged to lay claim to microorganisms artificially designed in their laboratories.

Recent court rulings in the United States have confirmed corporate entitlement to exclusive ownership and commercial control of new life-forms.

Although the Patent and Trademark Office had originally refused requests by Upjohn and General Electric for commercial patents relating to microorganisms developed by company biologists, these decisions were overturned in front of the Court for Customs and Patent Appeals.

On October 8th, 1977 the Upjohn appeal was granted. Dr. Malcolm Bergy had been able to produce the antibiotic lincomycin from a strain of "streptomyces vellosus." The bacterial strain essential to his invention was perhaps not novel, since it was taken from a soil sample in the south western United States, but the pharmaceutical products that can be manufactured from a biologically pure culture of the streptomyces bacteria were found to be both new and to exhibit the necessary utility to meet patentability requirements.

On the 2nd of March, 1978, the same court decided that General Electric research scientist Ananda Chakrabarty's microorganism, synthesized from the bacterium *Pseudomonas*, using gene-splicing techniques, and capable of digesting petroleum in oil spills, was acceptable as a

patentable invention. In its judgment the court found that "the nature and commercial uses of biologically pure cultures of microorganisms are much more akin to inanimate chemical compounds... than they are to horses and honeybees, or to raspberries and roses."

The Patent and Trademark Office presented an appeal to the Supreme Court, which after having examined the evidence, called upon the Court for Customs and Patent Appeals to reconsider its

decisions in the light of another case where it was ruled that a computer program didn't correspond to the normal criteria for patenting.

However, on the 29th of March, 1979, the Appeal Court dismissed the computer program analogy as an irrelevant precedent to the Upjohn and G.E. hearings and in a 4-1 majority reaffirmed its original decision in favour of the two corporations stating that "the fact that microorganisms are alive is a fact without legal significance."

Handing down the majority position, Judge Giles Rich said: "For nearly 200 years, since 1793, the conditions of admissibility have been construed liberally to include the most diverse range imaginable of unforeseen developments in technology." He also reminded that Louis Pasteur had been granted, in 1873, U.S. patent 141072 for yeast as an article for manufacture.

The court rulings only confirmed the growing commercial importance of genetic engineering.

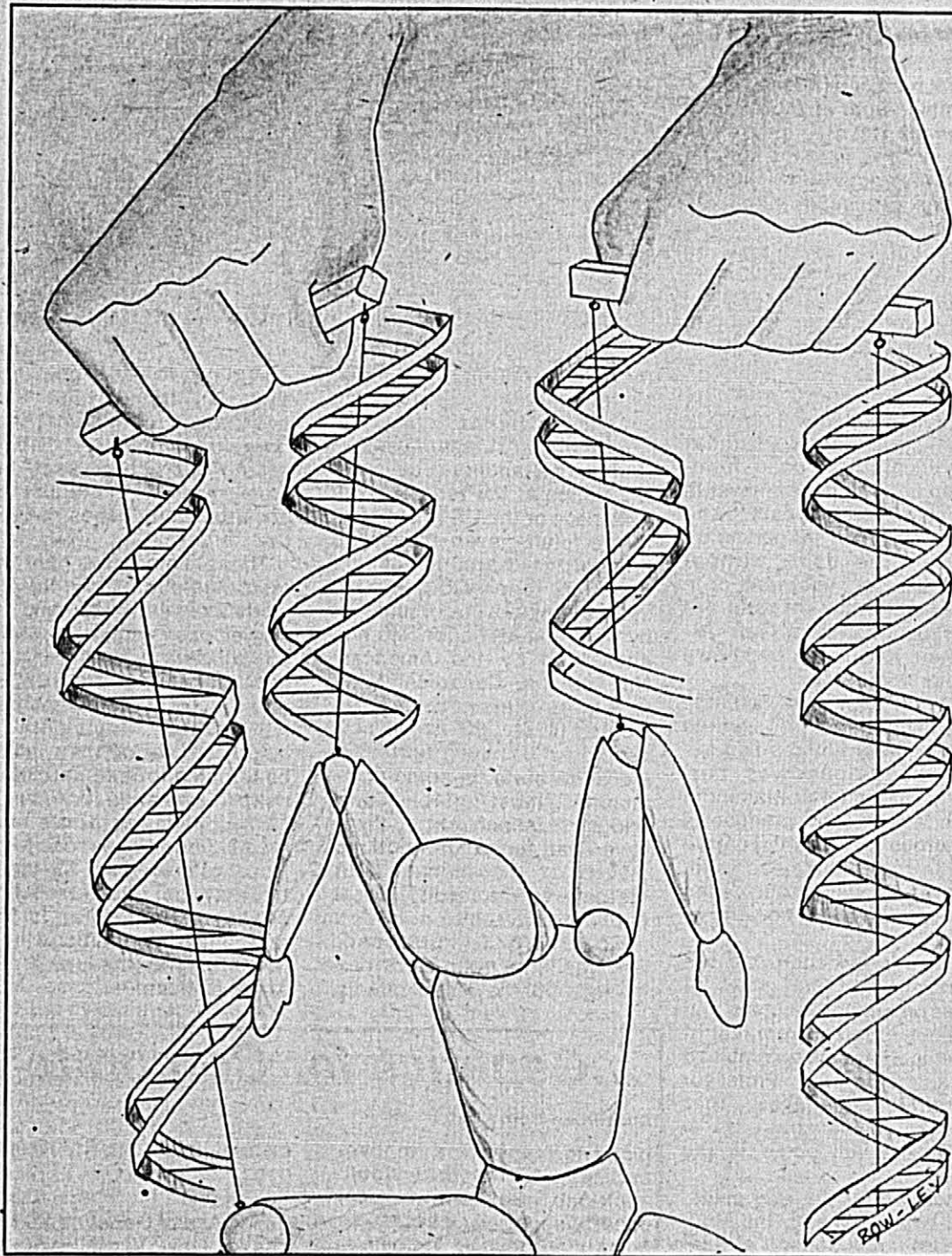
At the same time, an advisory committee to the National Institute of Health (U.S.) recommended that a large portion of current U.S. research in genetic recombination be exempted from certain stringent safety regulations enforced since 1976. Specifically, the NIH committee called for the relaxation of guidelines pertaining among other things to the scale of operations permitted in the bacterial production of insulin. The new proposals would allow corporations involved in genetic research to conduct work on insulin in quantities greater than the 10 liter limit which previously existed.

The looser restrictions were born of pressure by certain companies bent on going to market with their new discoveries. So far several breakthroughs in genetic engineering techniques have demonstrated the feasibility of the efficient production of substances such as interferon, a viral inhibitor, somatotropin, a human growth hormone used to combat hypopituitary dwarfism and also to treat burns, to mend bone fractures and to prevent muscular atrophy in geriatric patients, and somatostatin, an important brain hormone. Two trail-blazers, Genentech, of Berkeley, California, and Lilly, along with many other genetic research groups who up to now have on the whole complied voluntarily with the NIH rules, obviously welcomed the less restrictive controls; now that it's easier to pursue experiments, expectations of commercial profit are so much greater.

Increasingly larger corporations are cashing in on what Fortune magazine has already called the "industry of the future," whose "billion dollar prospects will make the electronics boom of the late fifties and of the sixties pale in comparison." Hoffman-LaRoche, Dupont, Schering-Plough, Standard Oil of California, to name a few, are getting involved either by founding their own research facilities or by buying into smaller enterprises.

One case in point is that of INCO (International Nickel Company). In 1975 INCO de-

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Graphic by Margot Rowley

DNA Research: Protecting the Public

by John Beckerle

In February of 1975, a group of 140 leading molecular geneticists met in Asilomar, California, to discuss the potential dangers and possible regulation of recombinant DNA research. The outcome of the meeting was a general agreement among scientists to ban certain experiments of high risk, and impose minimum requirements for the containment of others involving the new technology. The purpose of containment is to prevent any new and potentially dangerous organisms created in the laboratory from escaping to the outside world and possibly upsetting nature.

In June of the following year, the National Institute of Health (NIH) in Maryland, release guidelines for all recombinant DNA research funded in the US by NIH or by the National Science Foundation (NSF). These guidelines were similar to those set by the scientists for themselves, but were somewhat more restrictive.

The two methods of containment, biological and physical, are divided into several sub-levels. Physical containment ranges from "P1," a regular laboratory bench with special disinfectant procedures and other common sense precautions, to the multi-million dollar P4 facilities comparable to the space vehicle decontamination laboratories in Houston, Texas.

Biological containment is ensured by using several different strains of the bacterium *E. Coli*, classified according to their chance of survival outside special laboratory conditions. The classification ranges from E.K1, denoting the standard bacterial host, to the crippled E.K3, which has less than one chance in a billion to survive outside the laboratory. Most experiments require a combination of physical and biological containment.

The guidelines classify experiments by conjectured danger on the basis of the genes (DNA) being recombined. For the recombination of genes from non-pathogenic bacteria, P1 plus EK1 containment conditions usually apply; for the recombination of human genes, it is necessary to operate under P3 plus EK3 or P4 plus EK2 containment conditions; and the recombination of the genes of highly pathogenic organisms such as botulism is banned.

One of the main reasons for opposition to guidelines is the fact that they are based on

unknown dangers, and hence tend to be overrestrictive. In the early stages of implementation of regulations, much research time is lost because of lack of facilities and the high costs involved (P2 facilities cost around \$25,000 while a P3 facility ranges in the hundreds of thousands of dollars). In addition, the special strains of bacteria or hosts used in the experiments are not readily available. Once available, work at higher containment levels proceeds more slowly due to the supplementary precautions and difficulties in dealing with crippled hosts.

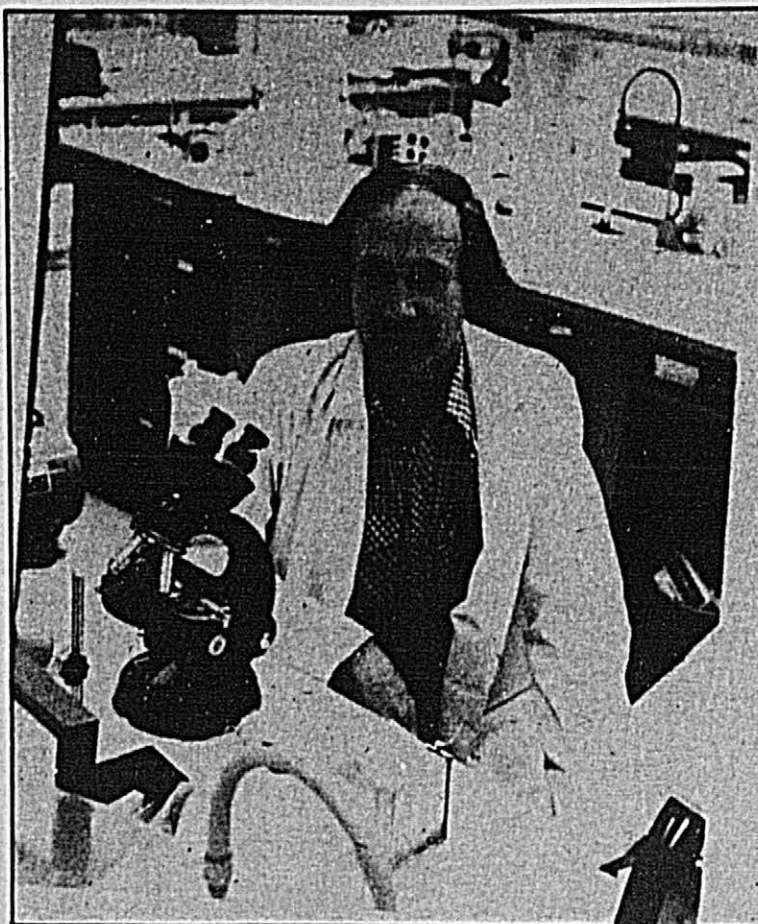
Proponents of regulation argue that only such measures can ensure safety. Further more, guidelines are revisable in the light of further knowledge.

According to McGill Biology professor Brandhorst, most experiments have been downgraded in containment level in the past three years, and many important experiments can now be done without specialized containment, or in a P2 laboratory. There are three reasons for this:

- (1) There have been no known serious accidents.
- (2) "Worst case experiments" have been performed, where an experiment classified as most dangerous was performed under P4 containment in an attempt to produce a dangerous (pathogenic) organism. In the recombined form, however, the dangerous genes were found to be non-pathogenic.
- (3) There is evidence that the organization of the genes of higher organisms (animals and plants) is different from that of bacteria, where the recombined genes are grown. Professor Brandhorst believes that "further downgrading is in order" and will occur in the future.

Shortly after the NIH guidelines were released, the Medical Research Council of Canada issued similar guidelines, using the levels A-F, with further restrictions on other hazardous non-recombinant genetic experiments. The MRC guidelines are viewed by many experts as more enlightened than the NIH guidelines because of this addition.

In England, restrictions based on the NIH guidelines were made into law, with all users of the new technology, both governmental and industrial, subject to its jurisdiction. However, in the U.S., where the greatest amount of work is being done in the field,



Professor Brandhorst: Downgrading of regulations is in order.

there has been no legislation on the guidelines despite the efforts of Senator Edward Kennedy of Massachusetts. Professor Brandhorst believes legislation at the federal level in Canada or the US is unlikely in the future, even though at present there are no restrictions on research done by industry, by private groups, or by governmental agencies not subsidized by the American NIH or the Canadian MRC (such as defence departments). In the US, legislation has so far been left up to the individual state. In some communities, most notably Cambridge, Massachusetts, there have been further restrictions placed on recombinant DNA research as the result of local public involvement.

According to professor Brandhorst, genetic industries in the US have voluntarily

complied with the guidelines thus far, possibly to avoid accidents and the subsequent lawsuits. The fear of liability seems to be the reason that prompted some scientists to accept the guidelines so readily.

These companies are not restricted directly by the NIH guidelines, however, and the slower pace required by high containment is costly in time and, if patents are needed, very much a factor in competition. Without legislation, a large corporation may indeed be tempted to take calculated risks in exchange for financial gains, and accidents may result. For this reason, legislation of guidelines for industry may be passed, but, if professor Brandhorst is correct, such measures will be taken only in the wake of a major accident.

by Louise Fabiani

Recombinant DNA technology offers scientists new possibilities for the synthesis of important proteins. It also gives society direct access to the process of evolution — a possibility that raises great hopes, but also entails considerable responsibilities. In weighing the benefits and the dangers, the scientific community has split. A debate on the hazards of DNA research has been raging for ten years, ever since the study of molecular genetics and the DNA molecule led researchers to manipulate the structure of DNA.

The DNA molecule is the familiar structure with the shape of a spiral staircase that is comprised of ordered sequences of four subunits called bases. It is the order of these four bases, taken as groups of three, which makes the Genetic Code, that is, the code that regulates the production of proteins.

Each triplet of bases corresponds to a different amino acid — the building blocks of proteins. These amino acids, carried by specific molecules which "read" the code, are attached to each other by special enzymes, and the final protein product is released into the molecule. Recombinant DNA technology consists of the introduction of specific sequences of bases (known as genes) into a bacterium, to have it manufacture a desired protein.

This process of protein production is assumed to be the same for all living things. However, knowledge of the actual genetic mechanisms of particular organisms is sparse. One notable exception is the genetic make-up of a bacterium which has served

Photo by Carl Helne

...Genetics for Corporate Profits

continued from page 5

cided to establish a venture-capital division that would seek out lucrative investment opportunities. It caught on quickly to genetic recombination. In 1976, it purchased \$500,000 worth of stock of Cetus Corporation, another Berkeley California group that unites scientific genius (its staff is a Who's Who of microbiology) with an aggressive management strategy. The following year it acquired 10% of Genentech. Finally, more recently, it set up a wholly-owned subsidiary in Europe: Biogen. The January 28, 1980, issue of Time reported that Biogen has developed synthetic interferon employing the bacteria *E. Coli*, and that prospects for com-

mercial exploitability looked good.

The Age of Genetics and the Brave New World are not around the corner and obviously nobody is arguing that we should commence the mass-production of genetically redesigned humans. But the happenings in and out of court do give us some disquieting food for thought.

As Ted Howard of "The Progressive" wrote, commenting on the March 29th Patent Appeal Court decision: "The Judges simply affirmed the scientific reductionism that permeates modern genetics, an assumption that every face of life — reproduction, dis-

ease, mental ability, even emotions and behaviour — can be explained in terms of a chemical base. In this process life is stripped of its essential meaning, its inherent value, its mystery. Or, as the court held in its opinion, 'life is largely chemicals.'"

But aside from such philosophical qualms, one is still left with an eerie sentiment of discomfort to hear the so-called "powers that be" of society call life a chemical function or an industrial product to be marketed for profit. Genetic engineering might make insulin and antibiotics more readily available, but it's also going to make some people awfully rich.

DNA Debate

for almost all experimentation in molecular genetics to date: *Escherichia Coli* (*E. Coli*). More is known about its genes than about those of any other organism on earth.

E. Coli has the unfortunate characteristic of being a normal inhabitant of the human lower intestine. It is this fact which exemplifies the dangers of DNA research: if a dangerous species of *E. Coli* were to be created and escaped the laboratory, it would find a natural habitat in the human gut.

Most of the *E. Coli* genetic material is found on a circular chromosome which is made up of tangled DNA and protein. The remaining information — only a small proportion of the total — is on small, self-replicating loops of DNA material called plasmids. These are the agents of genetic transfer and exchange. Their manipulation is the basis for all the recent breakthroughs.

Sometimes the plasmids exchange a gene or two in a tiny fragment with the mother chromosome. Somewhat less frequently, two bacteria will line up and one will give a piece of its plasmid DNA to the other in a process called conjugation.

It was not until 1971 that a successful transfer of a foreign gene into an *E. Coli* plasmid was accomplished by a microbiologist. The report that followed sparked off a controversy that still rages.

The procedure is relatively simple. The plasmid loops are first isolated from the cell, then cut open by special enzymes. Once opened, they are mixed with a solution containing the genes one wishes to "transplant" from any other organism. The new genes attach themselves to the "sticky ends" of the opened plasmid loop which is subsequently closed, and incorporated back into the living bacterial cell. These added genes are then "read" along with the *E. Coli* genes. When the cell divides, its chromosomes make copies of themselves, including the new gene. After a day of uncurtailed growth, there may be a billion copies of this new gene, each copy making the specified protein for the cell (and the experimenters).

The prospects for the use of this technique are very promising. Any substance can be cranked out of these microscopic "factories" just by inserting the appropriate genes into the *E. Coli* bacterium. And progress is rapidly being made in the area of gene coding.

In 1977, the brain hormone somatostatin was synthesized through recombination tech-

niques and recently, the insulin gene was engineered into a strain of *E. Coli*. The latter is significant, as supplies of natural insulin, derived from pig pancreases, are limited. Insulin is instrumental in the treatment of diabetes mellitus. The creation of a bacterium capable of eating away oil spills and another which enables crop plants to fix atmospheric nitrogen in their roots — a feat accomplished naturally only by legumes — are within reach.

Each of these has potential benefits for man, but some biologists protest that such tampering with the basics of life constitutes — on a larger scale — interference with the processes of evolution. Defenders of the research argue that man has been altering the line of nature ever since he domesticated and selectively bred plants and animals. However, as Nobel Laureate George Wald points out, such interference always operated within the limits of the species. Donating human genes to a bacterium extends well beyond these barriers.

Another fear is that, no matter how unlikely the escape of a new strain of *E. Coli* is (with either a harmful or benign genetic cargo) it is considerably more probable with a species so well-suited to living in the human system. Other species, however, will not do because researchers are as yet unfamiliar with them.

In March of last year, a group of DNA researchers published a pair of articles in the journal *Science*, concerning their work with *E. Coli* and a type of virus called polyoma which infects mice. In an attempt to prove that *E. Coli* would not harm mice into which they were injected, they incorporated the viral DNA into the *E. Coli* and administered them to the mice. They found that in no instance did the mice exhibit the condition which the original virus was capable of producing.

Other scientists, such as James Watson, have gone further in their criticism of opponents of the research, who, they claim, have misled the public with unfounded doomsday scenarios. These scientists demand relaxation of regulations. However, the debate is far from settled. In a December 1979 issue of *Nature*, a cancer researcher and a microbiologist launched attacks on these claims. They pointed out that the experiments described were potentially very harmful, and indeed, were inconclusive. "The observed lack of infectivity conveys a false sense of security," they charged.

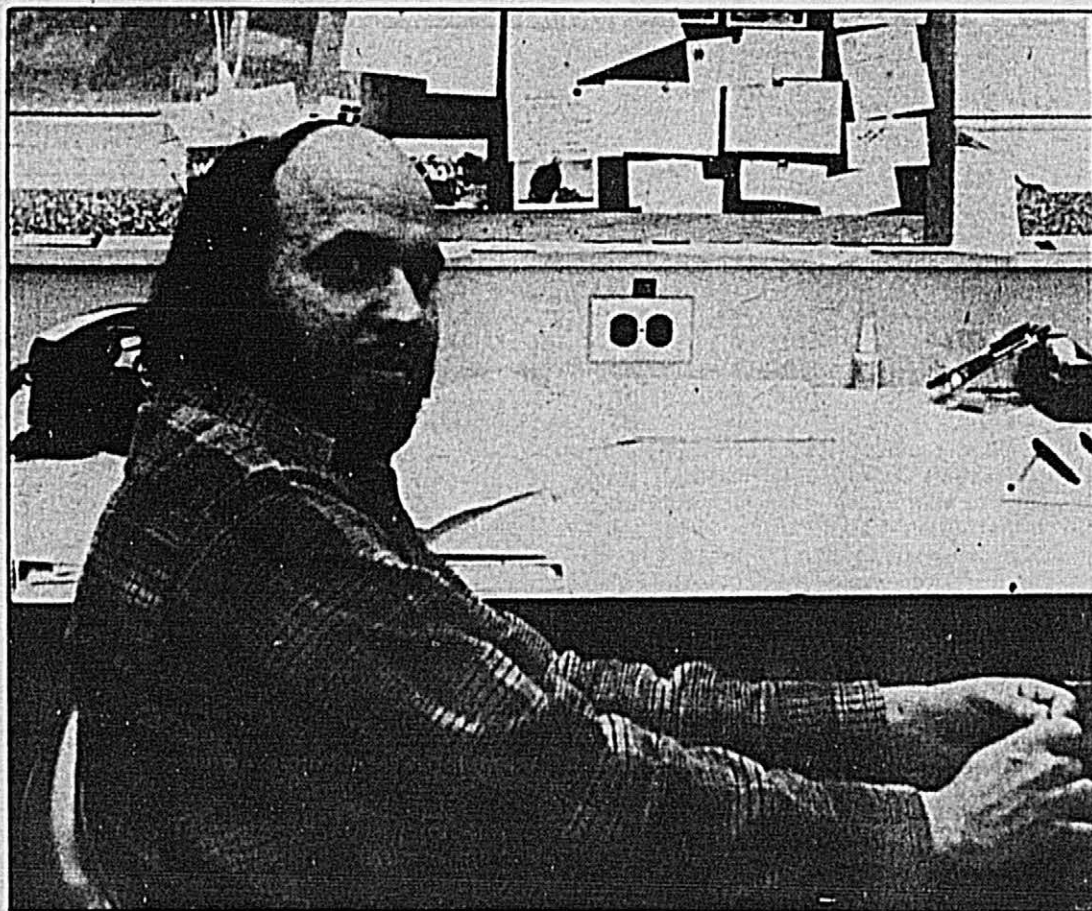


photo by Henry de Cuyper Cadmus

Professor Verma: Regulation, but not restriction.

McGill Researchers Design Genes

by Gail Helmann

As the issue of the hazards involved in experimentation with recombinant DNA is being hotly debated by scientists and government agencies, McGill Biology professor, Dr. Desh Pal Singh Verma, is conducting research into an area of the field that may hold the key to increased and more economical agricultural productivity. Dr. Verma's special interest is nitrogen fixation, a process by which atmospheric nitrogen is chemically altered so as to be useful to plants, thereby eliminating the need for the application of nitrogen fertilizers.

Nitrogen fixation occurs naturally in legume plants (beans, clover and alfalfa) which have red-colored nodules clinging to their roots. These nodules house the bacteria (*Rhizobium*) that fix nitrogen. Verma and his team of eight researchers are studying the "symbiotic association" between *Rhizobium* and leguminous plants in an effort to identify the plant genes that regulate the association and determine their mode of regu-

lation. They hope to then manipulate these genes, and eventually seize one gene at a time for the purpose of genetic engineering. The goal of the research is to permit the transfer of the nitrogen-fixing capacity from legumes to non-nitrogen-fixing plants.

Verma estimates that 10 to 20 billion dollars worth of nitrogen is fixed annually in leguminous plants.

"It just occurs," he said, "we take it for granted."

Another 10 billion dollars worth is added as a fertilizer to increase the yield of those plants that are unable to fix their own nitrogen.

The ability to create crops capable of self-fertilization, while being economically advantageous, would have far-reaching implications for the world's food supply. Still the work being done at McGill goes largely ignored and unfunded by the agricultural industry.

"They simply haven't cared," Verma said.

Presently, funding for the

program is obtained from the Cell and Molecular Biology Panel of the Science Research Council of Canada and the Rockefeller Foundation in the United States.

The research is expensive owing to the need for the construction and maintenance of labs and containment facilities. At this time McGill has one "P3" facility for medical use, though Verma doesn't feel the dearth of containment laboratories for his type of work is critical.

"The guidelines are now being relaxed because the original fear of the biohazard involved in work with recombinant DNA has lessened. Most of the containment level regulations have been dropped which makes things much more workable," Verma said.

Verma favors the regulation, but not restriction of recombinant DNA research.

"Ultimately the responsibility lies with the investigator," he said. "This is not something you can enforce through military regulation. We have to carry on responsible experiments."

Today

Auditions:

For directing projects in Morrice Hall, room 106, from 12:00 to 1:30 for *Amédée* by Ionesco; 1:30 to 3:00 for *Norman, is that you?*; 5:30 to 7:00 for *Amédée*. In Morrice Hall room 207 from 5:30 to 7:30 audition for *The Tenor*. For info call Tuesday Night Cafe at 392-4637.

Term Paper Workshops:

Each day this week, the Undergraduate

Science Writers:

Come and discuss the dismal future that

awaits us at 4:00 p.m. in the Daily offices. All welcome. Library offers, at 11:00 a.m. and 3:00 p.m., a workshop on researching term papers. Today's workshops focus on Social Sciences. Also, today, at 12:30, the Department of education in English offers a workshop on writing the term paper. All workshops begin at the info desk in the Undergraduate Library. Call 392-4288 for info.

Faculty of Music:

555 Sherbrooke in the Pollack Concert Hall at 8:30 p.m. McGill/CBC Festival Allegro: Louis-Philippe Pélletier, pianist; works: Schumann, Debussy, Schoenberg, Tremblay. In recital room C-209 at 4:00 p.m. Kathleen Anderson, soprano; Céline Dutilly, piano, present a recital of operatic arias.

Kappa Alpha Theta:

We'd like to invite all McGill women over to 3454 Stanley, apt. 4, today from 12:00 to 2:00 for lunch. Hope to see you there! Baha'i Club: Weekly meeting today from 12:00 p.m. to 2:00 p.m. in Union room 310. Please make every effort to attend and bring friends too.

Savoy Society:

Rehearsal in Union room 302 at 5:00 for orchestra, 7:00 for leads and 8:00 for full cast. Women's Squash Club: Advanced players meet at 7:00 p.m., beginners and intermediates at 7:45 p.m. on the courts in the Currie Gym. New members welcome.

Israel Action:

General meeting for all interested in getting involved. Today at 5:00 p.m. at Hillel. Student Members of the Faculty of Arts: Meeting of all student members of the faculty at 3:00 p.m. in Union room 310. Faculty meeting will follow at 4:00 p.m. in the Leacock council room.

Continued from page 1

through autonomy. And so, at the University of Toronto, Guelph and Waterloo the papers went for separation from their societies."

Topp said the current relationship between Council and the Daily cannot help but result in institutional conflict.

"A student newspaper must, if it's doing its job, cover the Council and its activities. From our point of view we've felt ourselves exposed to financial pressures. Financial attacks have been known to happen in years gone by, and at other camps."

Topp cited another problem with the current setup — Council has no control over the Daily's content but is financially responsible if the paper libels someone.

The solution to these problems, according to the Daily brief, is to make the Daily into a separate corporation responsible to a Board of Directors. Under this setup students would pay three dollars per semester to the paper and could obtain a refund during the first two weeks of the semester if they were unsatisfied with the paper's quality.

"The money the Daily gets would be contingent on the paper's quality; as well, we feel more comfortable trusting our readers to give us money than we do in risking an arbitrary budget cut from a future Council," said Topp.

Law rep. to Senate Brad Armstrong strongly disagreed with the Daily proposal.

Said Armstrong: "Under the proposal to incorporate, the Daily will not have financial stability. For the argued gains of fictitious editorial freedom they're giving up financial stability."

Law representative Neil Wiener also disagreed with

the need for incorporation, and said that autonomy was possible within the Society's current framework. He presented two alternative proposals that would entrench the Daily's autonomy from Council into the Society's constitution.

He explained to the Council that the body responsible for the Daily's finances, the Publications Board, is currently forced to report back to Council. He proposed constitutional changes to make the Publications Board autonomous from Council.

Wiener also presented an alternate proposal for funding the Daily. According to the proposal, the Daily would receive 15 per cent of Society revenues.

"After that if the Daily wanted an increase it would have to be approved by the Publications Board and then by the student body, but the Students' Society would have no call on the funds paid for the use of the Daily," said Wiener.

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Tuesday
February 12

12 noon
Leacock 26

Redmen barely stayin' alive as Stingers hustle to 85-65 win

by W.A. Willis

Redmen coach Butch Staples' thoughts must be drifting south of the border as of late. No, it isn't the allure of warmth and sunshine that draws his attention there, but rather the fond memories of Joey, Charlie, Pat, Steve and Gregg.

Who are these individuals that are able to distract Staples from his present predicament at such a crucial time. They are all examples of former Redmen, superb athletes who were each possessed with an irrepressible desire to win, and win they did. In fact, Joey's and Charlie's winning ways brought Staples the title of "National Coach of the Year."

As of last Friday evening, Butch is not in the running for that national accolade, and the Redmen seem destined to remain in third spot in the QUAA standings. Their hapless play made them all prey to the Concordia Stingers, 85-65.

The Redmen led off the scoring and that was the first and last time they had the upper hand for the next 40 minutes.

Five Stingers finished the game in double figures. Center

Leon Bynoe led all scorers with 22 points, Doug Whaley had 16, Gary McKelgan 13, Rick Brown 12 and Harley Lawrence 10.

Guard Lawrence played a strong defensive game, causing many of the 27 McGill turnovers. The Stinger 1-4 zone with two medium posts was too much for the Redmen offence. McGill shooting percentages were low and shots were being forced.

With each missed opportunity the Redmen became increasingly frustrated to the point where all of Staples' attempts to revive the offence proved futile.

"We didn't play hard enough and we played scared," Staples said. "As well, we didn't fast-break them at all. It was a game of statistics: 27 turnovers, 12 defensive boards and poor shooting percentages."

Some sparks in the McGill lineup were Rick Rusk with 19 points, François Plourde with 12, and Mike Homsy with 8 points.

Rusk was bothered by a sore back but he retained his soft touch. "I warmed it (the back) up well and it didn't

affect my performance," he said.

Sylvain Castonguay's "Ippolito"-like defence was the only show of spirit among the Redmen. Commented Staples, "In the first half Sylvain made things happen but I guess it wasn't enough to lift the rest of the team up. Mark (Adelman) looked tired and Jonathan (Barnes) was extremely frustrated."

"He (Jon) wasn't getting help from his teammates. He would break the Stinger press but then there would be no one to give the ball to. We didn't once look like a team."

What, then, is ailing the McGill Redmen? If the Stingers are beatable, as I believe they are, then why has McGill never come close in three tries?

Asked another way, what do Joey, Charlie, et al have that the 1980 Redmen don't have?

A winning attitude; and attitude that transcends the self and places the interests of the team far above all else. It gives the team the synergistic element whereby the sum of the team's whole is greater than the sum of the parts.

As guard John Ippolito said,



Photo by Richard Katz

Con's Leon Bynoe takes the ball to the proverbial hole. Bynoe did that well enough for 22 points, but on this play he drew the offensive foul.

"We're not the pros, we can't turn it on and off when we want. We've got to turn it on all the time."

Staples felt that the team "has to do some real soul-searching" before it could get on track.

With a game coming up this Friday against Bishop's at Lennoxville, the Redmen don't

have much time to soul-search. Having almost beaten the Gaeters in their last confrontation, the Redmen know that this game is definitely within reach. In fact, any outcome other than a win could prove fatal to the team's morale, since self-respect as a team can only be gained out on the court.

Vanier ousts Martlets in final

by Daniel O'Lartig

The McGill Martlets finished second in the Invitational Volleyball Tournament held this weekend at the Currie Gym.

The competition featured exciting play throughout the day, as many intrigued onlookers stopped by to watch the grace and agility of the volleying damsels. The other teams present were: Vanier College, which eventually defeated McGill in the final, the Ottawa Eclipse V.C. and the Carleton University Robins, which finished third and fourth respectively.

It was only by an advantage of one extra set won that Vanier was declared winner of the round-robin while the Martlets and the Ottawa Eclipse, ranked second in Ottawa, tied for second place with four wins and three losses each.

The officials had to go to small points to determine which one of the teams would gain access to the final. After counting and recounting, McGill got the edge over Ottawa: 94-88 for the Martlets (points for - points against) as compared with 83-80 for Ottawa.

Though not as quick or as powerful as their male counterparts, the display offered by the Martlets and Vanier was spectacular. Highlighted by long exchanges and defence-oriented play so typical of women's volleyball, the intensity of the game filled the Currie Gym as a small but intimate crowd of a dozen apprehensively followed the unfolding final.

In the first set, Vanier made full use of its only advantage over McGill: its height. Boasting three players of 5'11" or over in its lineup, Vanier outspiked and outblocked the Martlets, quickly jumping to a 5-0 lead.

While the McGill crosscourt attacks were consistently blocked or recovered by faultless Vanier backcourt coverage, the opposition's attacks either scored immediately, or if dug up, left McGill unable to effectively strike back.

As the set wore on the gap between the two teams widened until at a score of 3-10, facing an insurmountable

deficit, the Martlets lost all their combativeness, ultimately going down 15-4.

In the second set, the Martlets bounced right back, to the great joy of their partisans. Attacking towards the line and not along the diagonal, as well as using tips in the middle, McGill took command of the game in the early stages.

Unfortunately, with McGill ahead 10-7, the team seemed to relax. Vanier's attacks once again overpowered the Martlets, as the CEGEP team recovered control of the play. With Vanier leading 13-12 and serving, their victory seemed certain.

Again the Martlets came back. A Martlet block recaptured the serve while a precise spike followed by a perfectly executed tip put McGill in front 14-13.

Despite their improved fortunes, victory eluded the Martlets. After the team exchanged a couple of points, Vanier's best spiker rotated back to the front row, to help her team edge out McGill 18-16, and capture the tournament.

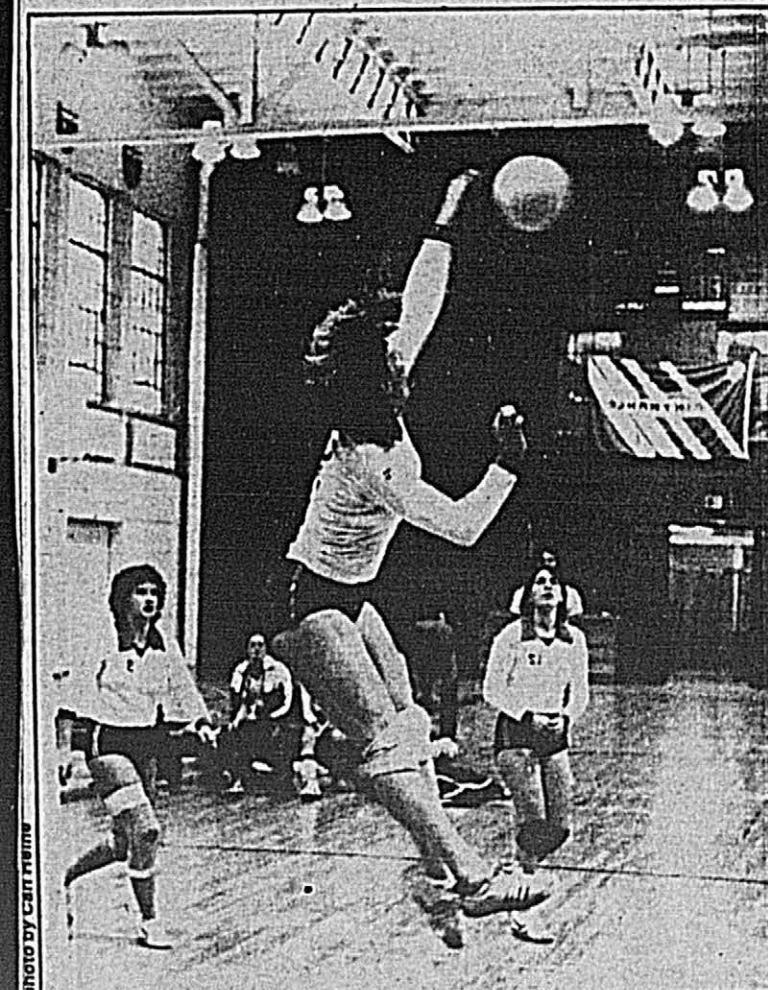


Photo by Carl Harris

Martlet captain Dana Reid pikes into the spike position.



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Redmen check Gaiters but Bish captures night 5-2

by Louis Rakita

"But you should have seen the one that got away!" Several members of the Redmen are echoing that statement this weekend after they outplayed the Bishop's Gaiters in almost every area of the game but the score, as they dropped a 5-2 decision at McConnell on Friday night.

Carl Graham led the way for the visitors with two goals and one assist. The Bishop's center tallied quickly off a face-off only 46 seconds into the first period. And again alone from in front of Redmen goalie François Grenier about half-way through.

There weren't all that many statistical notes (only 7 penalties) but both teams were able to stifle the opponents' powerplay with relative ease and the play was seldom very physical, with very brief flareups late in the first and second periods.

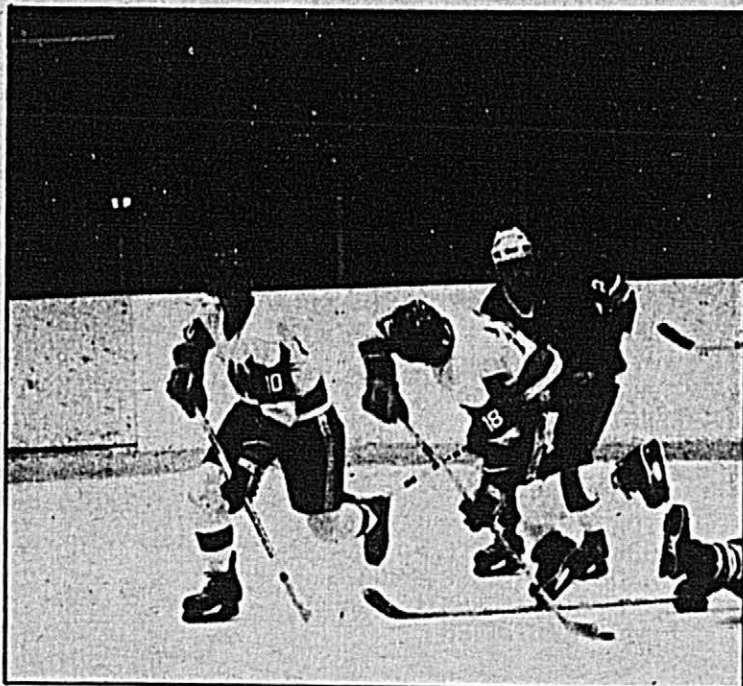
The second period, like the first, saw Bishop's pot an early goal. With a little over a minute gone, Mario Claude's screened slapshot from 20 feet out gave Grenier no chance, and the Gaiter's had a 3-0 lead, which they decided to sit on for as long as they could. Unfortunately for the vociferous crowd on hand, it made for very dull hockey for a while, the only breaks to the monotony being incidents of physical assault as bruises and cuts sprouted.

At this point Grenier was forced into some splendid saves, thwarting innumerable Gaiter scoring attempts. But the McGill offence was unable to get untracked, despite good rushes by Kenny Covo which were few and far between, as the frequency of whistles took a dramatic rise upward.

Finally, the line that has provided a great deal of excitement in the past two weeks struck again, as Hopalong Boisselle sped into the Bishop's zone on a breakaway. Goalie André Paradis stopped the initial shot, but linemates Dave Moritsugu and Pat Shannon forced the play until Boisselle was all alone in front of the net to fire his fourth goal of the year by Paradis.

With under three minutes to go, this superb effort gave the Redmen, and their fans, something to cheer about. Being on the scoreboard gave the team a lift going into the dressing room.

The Redmen borrowed a page from the Gaiter's book in the third period as Dave Mitchell's shot went in (or so ruled the referee; play went on for about 30 more seconds) pulling the team to within one of Bish.



Redmen Dennis Gratton is about to get off a shot with the aid of Rob Hill (10).

The players could sense victory now.

Bishop's "scored" next at around six minutes, but again, nobody noticed, and the

Redmen players certainly weren't going to enlighten the officials. The goal didn't count.

When the glass at the end of the arena was jarred loose in

the final stanza, and the players were entitled to an unscheduled free skate, the tension and frustration were evident in their expressions.

Carlo Command said, "We had two guys all alone in the slot, and couldn't score. We haven't had a bit of luck in this building."

True, one thing lacking on the club is the finish around the net. But both goalies were stingy on this night, although Rob Hill mentioned, "We made him (Paradis) look good. We were firing right at his pads, especially from the slot position, and didn't aim for the corners."

Despite the netminders' reluctance to balloon their goals-against averages, this was the third most exciting of three bland periods. Unfortunately for McGill, the Gaiters scored a legitimate goal with six minutes to go, demoralizing the Redmen.

Grenier was pulled in the last minute and a half, but a Bish empty-net goal was icing on the cake.

Redmen Rumblyings: Super Redmen penalty killers have now allowed only one goal in six games....Redmen play each team one more time, except Bishop's....Each goalie has been removed from one game

this year....Ken Covo who was on defence for several shifts, now has 12 goals and 23 points, good enough for Top Ten distinction...The eighth McGill shot on goal Friday will be their 500th this year...Lucio Paiano was penalized in the third period, bringing his total to 4 minutes....Sammy "the Hammer" Collizza didn't dress for the second consecutive

game....With Friday's loss, McGill is mathematically eliminated from the playoffs. The team can attain no higher than sixth place, and only if they don't lose more than 4 points to Laval Rouge et Or.

Martlets flip over Bishop's, 7-4

by The Phantom Runner

"Twiddly dum, twiddly dee, shivering in the Winter Stadium, with my hot toddy and tea."

Honestly, I never thought that I could be so cold.

At 2:56 of the first period I just couldn't endure it any longer. Besides, it was getting difficult to see the game, what with the icicles forming around my eyelashes. I placed a phone call to my mother, pleading with her to send me as soon as possible some thermal underwear.

Thus I was not around for the Martlets' first goal, but I have it on reliable authority that Jean "Scoring Machine" Rogers took a long lead pass from Madeline "Racy" Raçicot, outskated the lone Bishop's defenceman and fired a wicked slapshot past the Bishop's goaltender. Don DiMaulo, former Martlet's reporter, swears that shortly after taking the pass that sent her into the clear, Rogers did a graceful pirouette at mid-ice, stopping halfway through her turn to wave good-bye to the Bishop's players.

After the game, I asked Jean about this rather unconventional gesture. I wanted to know whether it was a gesture bespeaking compassion and understanding or whether it was part of Jean's

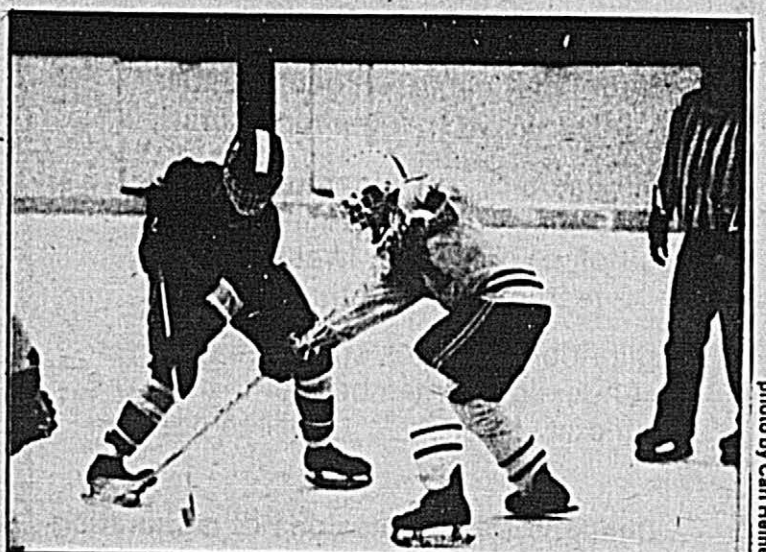
attempt to fulfill her as of yet unfulfilled thespian ambitions.

"Well, Phantom," she answered, "It was more of the former really. You see with the way Maddy passes the puck, I just knew that I'd be behind the Gaiterettes all night. It was my way of introducing myself face to face."

Meanwhile, back at the other end of the rink, Martlet goalie Laura Drover, was making like Houdini. Time and time again the Bishop's players would be sent away from the McGill cage shaking their heads in amazement and cursing in Italian as Drover displayed the best glove hand seen in these parts since Mike Jorgensen was traded away by the Expos.

To be quite honest, there must be a little of the sadist in Laura. She seems to wait for the last possible moment to frustrate the opposition. Just as they're lifting their sticks in joyful anticipation of a goal, she'll flick out her glove, swallow the puck (with her glove that is) and make the opposing forwards wish they'd tried out for the volleyball team.

Finally at 8:28, after making yet another brilliant save, Laura proved that she is only human. After she had robbed Kelly Holmes with a sprawling save, she was in no position to prevent the Gaiterettes' Sherry Lunan from lifting the rebound high into the netting to tie the



Martlet Dale "Dazzling" Blenkhorn, who scored the hat against Bish, shares her luminosity with a Gaiterette.

score at 1-1.

Drover proved her mettle as she came back to rob Lunan, Harrison and Holmes with inspiring saves. Bishop's showed its frustration as Dougherty high-sticked McGill's Linda Marchand and Mullins tripped Linda "Undertaker" Pateras. Only the first infraction was called though, as the referee seemed to understand that Drover's goaltending could make a delinquent out of Malcolm Muggelidge.

Finally at 11:30, the Martlets repaid their goalkeeper's efforts. Karil "Chico" Middledbrook took a pass from Anne

Lapointe at the point and sent the puck along the ice into the far corner of the net.

McGill's fifth goal defies description, but I'll try my best. It was scored by Blenkhorn who has more moves than an Egyptian belly dancer. For this, her second goal, she merely threaded her way around every Bishop's player on the ice (and a few off it too). She put a series of moves on the Bishop goalie that ended up with this unfortunate woman's legs tied in a knot and her eyes glazed over with disbelief and utter incomprehension. Just trying to watch Blenkhorn, I fell out of my seat down the stairs.

McGILL
ARTS & SCIENCE
UNDERGRADUATE SOCIETY

Last day for nominations

for the following positions:

- 1-President
- 1-Vice-President, Arts
- 1-Vice-President, Science
- 1-Secretary
- 1-Treasurer
- 2-Arts Representatives to Student Council
- 2-Science Representatives to Student Council
- 3-Members at Large

RULES

Candidates' nomination petitions must include their name, student number, degree, year and phone number.

A minimum of fifty signatures with student numbers are required for the position of president; twenty-five are required for all other positions.

Nomination petitions should read, "We the undersigned members of the A.S.U.S. nominate _____ for the position of _____."

Deadline for submissions of nominating petitions:

**Monday, February 11, 1980
5:00 p.m.**

Room B-22, Union Building

N.B.: There will be a meeting for all candidates in Room B-22 at that time.

FEBRUARY 21
GENERAL
ELECTIONS

Students' Society ELECTIONS



TO BE HELD

WEDNESDAY, MARCH 5, 1980

(ADVANCE POLLS - MARCH 3, 1980 - PLACES TO BE ANNOUNCED)

**NOMINATIONS ARE HEREBY CALLED
FOR THE FOLLOWING POSITIONS**

*STUDENTS' SOCIETY EXECUTIVE

PRESIDENT
VICE-PRESIDENT, Internal Affairs
VICE-PRESIDENT, External Affairs

*BOARD OF GOVERNORS

ONE UNDERGRADUATE REPRESENTATIVE (Incl. Law, Medicine & Dentistry)
ONE GRADUATE REPRESENTATIVE

*SENATE

ARTS (Incl. Social Work)	1 REPRESENTATIVE
DENTISTRY	1 REPRESENTATIVE
EDUCATION	1 REPRESENTATIVE
ENGINEERING (Incl. Architecture)	1 REPRESENTATIVE
LAW	1 REPRESENTATIVE
MANAGEMENT	1 REPRESENTATIVE
MEDICINE (Incl. Nursing & P & OT)	1 REPRESENTATIVE
MUSIC	1 REPRESENTATIVE
GRADUATE STUDIES (Professional)	1 REPRESENTATIVE
GRADUATE STUDIES (Academic)	1 REPRESENTATIVE
RELIGIOUS STUDIES	1 REPRESENTATIVE
SCIENCE	1 REPRESENTATIVE

DEADLINE: THURSDAY, FEBRUARY 14, 1980 (See below)

CANDIDATE'S QUALIFICATIONS AND NOMINATING PROCEDURES:

EXECUTIVE

President — may be any member of the McGill Students' Society in good standing with the University except:

- i) partial students taking less than three courses
- ii) students registered in the Faculty of Graduate Studies and Research who are non-resident students or full members of the teaching staff.

Nominations must be signed by at least 100 members of the McGill Students' Society together with their year and faculty.

Vice-Presidents, Int. & Ext. — same qualifications as for President. Nominations must be signed by at least 75 of the McGill Students' Society together with their year and faculty.

BOARD OF GOVERNORS

Candidates must be members of the McGill Students' Society and must be registered at McGill University as full-time students in good standing following the normal load of courses per year. Nominations must be signed by at least 75 members of the McGill Students' Society together with their year and faculty.

SENATE

Candidates must be members of the McGill Students' Society and

1. be students in good standing who are registered full-time for a degree or diploma and have satisfied conditions for promotion in their previous year of studies,

or

2. be students in good standing who have satisfied conditions for promotion in the previous year of studies and who are registered in a degree or diploma program, but who are permitted by Faculty to undertake a limited program,

or

3. be students in good standing who are registered full-time or in a limited program for a degree or diploma, and who are repeating a year for reasons other than academic failure.

Nominations must be signed by at least 50 members of the McGill Students' Society who are in the same faculty as the prospective candidate together with their year and faculty, or by 25% of the student enrolment in the faculty together with their year and faculty, whichever is the lesser of the two.

N.B. Students in Continuing Education are NOT members of the Students' Society.

OFFICIAL NOMINATION FORMS ARE AVAILABLE AT THE STUDENTS' SOCIETY GENERAL OFFICE, ROOM 105 3480 McTAVISH STREET.

ALL NOMINATION FORMS MUST HAVE THE CANDIDATE'S SIGNATURE TOGETHER WITH HIS YEAR AND FACULTY, ADDRESS AND TELEPHONE NUMBER.

*CANDIDATES MAY RUN FOR ONE POSITION IN EACH OF THE THREE CATEGORIES PROVIDED SEPARATE NOMINATION PAPERS ARE HANDED IN FOR EACH POSITION.

A PENSKECH OF 100 WORDS OR LESS AND A PHOTO OF THE NOMINEE MUST BE HANDED IN WITH THE NOMINATION.

ALL NOMINATIONS MUST BE SUBMITTED TO THE STUDENTS' SOCIETY GENERAL OFFICE IN THE STUDENTS' UNION NO LATER THAN:

4:30 P.M. THURSDAY, FEBRUARY 14, 1980
c/o Elizabeth Scarr, Secretary

Sandra Milton
Barbara Montgomery
co-Chief Returning Officers